

Assignment 3 – SQL

Due Date: November 1 at 11:59pm

For this assignment, we are using the “countries database”, a.k.a. *Mondial*.¹ As before, relevant files will be available on CSIF computers (also see the class site and mailing list for updates!)

Problem 1 (SQL)

Formulate the following questions as queries in SQL. The database schema and database instance used for submission are available on CSIF and the class site. For updates also see <https://sites.google.com/site/ecs165afall2013/assignments>.

For each query, put the columns listed in **bold** in your SQL `SELECT` clause, and put them in exactly that order (otherwise, our grading script will flag your answer as wrong)!

1. For each country, find the city (or cities) with the largest population. `SELECT` the **country code** of the country, followed by the **province** that the city is located in, along with the **city name**.
2. (a) List each country together with the count of neighboring countries. For simplicity, *ignore* (i.e., exclude) the countries that have no neighbors. Your resulting `SELECT` clause should have the **country code**, followed by the **count** of neighboring countries.
(b) Now also include the countries with no neighbors. Hint: Use an outer join. `SELECT` the **country code** of the country followed by the **count** of neighboring countries.
3. What countries have at least 4 neighboring countries? Order the result by the number of neighboring countries. `SELECT` the **country code** of the country followed by the **count** of neighboring countries.
4. For each country, list its population and the total population of all neighboring countries. Select the **country code** of the country followed by its **population**, followed by the **total population** of all neighboring countries (and if it has no neighboring countries, **NULL**).
5. List all islands that have a city which is not located at a sea. `SELECT` the **island name**.
6. List all religions with the percentage of followers world wide. `SELECT` the **religion name** followed by the **percentage** of followers world wide. For the percentage, round your final result to 2 decimal places, using the `ROUND` function as follows: `ROUND(column, 2)`. Note that, for example, 2.01% should be returned as 2.01 (like the Percentage column of the Religion table) and not as .0201.

¹Our database instance is derived from the “Mondial” database by Wolfgang May at the University of Göttingen: <http://www.dbis.informatik.uni-goettingen.de/Mondial>. It is planned that the final project assignment, we will further extend this database.

7. List all pairs of countries that are members of the same organizations. List each pair (A, B) only once by including only (A, B) but not the symmetric pair (B, A) in the result (hint: use "<" to compare the strings). Exclude countries that are members of no organizations. SELECT the pair of **country codes**.

Problem 2 (EXTRA CREDIT) A tribal chief of Khartoum is inviting his fellow chiefs to a meeting. He invites all chiefs from African countries that are reachable from Khartoum by crossing the border twice, however excluding neighboring countries. We assume that for each 100,000 inhabitants there is one chief.

- a) How many chiefs are invited to the meeting?
- b) Modify your solution according to the following rule: In countries with a population density of more than 60 people per km², there is only one chief for each 200,000 inhabitants.